

Tofu: A Plant-based Protein Superstar

Tofu, also commonly called bean curd, is made by coagulating soymilk using calcium sulfate or nigari salts to form a solid block. Tofu comes in a variety of textures, from silky or soft to medium, firm, or extra-firm. An extraordinarily versatile product, tofu has unique nutritional features and health benefits that have been established over many decades. Tofu absorbs the flavors of whatever dish it is used in – firmer tofu tends to work well in savory dishes, while soft or silky tofu is perfect for desserts.

First produced in China during the Han Dynasty about 2,000 years ago, its use spread to other parts of Asia, and in time tofu became a dietary staple in households throughout Asia. Tofu is now a much treasured, economical protein source for people around the world, particularly those who prefer plant-based protein sources.

Tofu Nutrition

Tofu is an excellent source of high-quality protein, containing the necessary amounts of all essential amino acids. It is also a good source of a wide range of vitamins and minerals, including manganese, calcium, selenium, magnesium, iron, and zinc. Tofu is relatively low in calories and has a very low glycemic index of 15. It is cholesterol-free, sugar-free, and low in saturated fat and sodium. As a minimally processed soyfood, tofu is packed with protective phytochemicals including phytoestrogens, flavonoids, phenolic acids, saponins, and phytosterols.

The table below compares the nutrient content of one serving of tofu with one serving of beef. The nutrients highlighted in green are higher in tofu than ground beef, while the nutrients highlighted in orange are more concentrated in ground beef.

Tofu vs 80% Lean Ground Beef

Nutrients	Tofu, firm (0.5 cups)	Ground Beef (3.5 oz/100 g)
Calories	181	254
Protein	21.8	17.2
Carbohydrate	3.5	0
Fat	11	20
Saturated fat	1.6	7.6
Linoleic acid (n-6)	5.5	0.42
Alpha-linolenic acid (n-3)	0.73	0.05
Cholesterol (mg)	0	71
Fiber (g)	2.9	0
Vitamin A (IU)	209	14
Thiamin (mg)	0.2	0.04
Riboflavin (mg)	0.13	0.15
Niacin (mg)	0.48	4.2
Folate (mcg)	36.5	7
Calcium (mg)	861	18
Iron (mg)	3.4	1.9
Magnesium (mg)	73	17
Manganese (mg)	1.5	0.01
Potassium (mg)	299	270

Selenium (mcg)	22	15
Zinc (mg)	2	4.2

Source: USDA Nutrient Database

In terms of nutrient density, tofu is a far better choice than 80% lean ground beef. While the beef is higher in calories, total fat, saturated fat, cholesterol, riboflavin, niacin, and zinc, the tofu is higher in protein, carbohydrate, fiber, essential fatty acids (linoleic and alpha-linolenic acid), vitamin A, thiamin, folate, calcium, iron, magnesium, manganese, potassium, and selenium.

In summary, tofu provides an excellent compliment of nutrients. It is a healthful addition to any diet and is a great protein choice for those who eat plant-based. For plant-based children, tofu helps to balance a high fiber diet with a high quality, digestible, lower fiber protein source. For those with higher protein requirements (e.g. seniors and athletes), tofu makes meeting protein needs easier.

Health Benefits

While fewer studies have singled out tofu, multiple studies have demonstrated health benefits of soyfoods in general. It is interesting to note that two of the world's five Blue Zones (places where populations live the longest, healthiest lives) use soy, including tofu, as dietary staples.

Evidence suggests that regular soy consumption lowers risk of coronary heart disease by reducing LDL-cholesterol and blood vessel inflammation and improving blood vessel elasticity. Soy has also been shown to protect against some forms of cancer (especially breast, prostate and GI cancers). Several studies

have demonstrated improved insulin sensitivity with soy consumption. Due to the high isoflavone content of soy, it also appears to favorably affect bone health, brain function, symptoms of menopause, skin elasticity, depression, and kidney function.

Tofu Safety Concerns

Tofu is not always portrayed in a favorable light. Concerns about allergies, antinutrients, and impacts on thyroid hormones are hotly debated on the internet. While some individuals do need to avoid or limit soy due to allergy or severe thyroid problems, for most people, soy foods are both safe and nutritious.

The prevalence of soy allergy is about 0.4% in children (who are at the highest risk). The most common reaction to soy in infants is eczema. Most children do outgrow their soy allergies, but those who are sensitive or allergic to soy need to avoid it.

Soy foods, like other whole plant foods, contain a variety of antinutrients, including trypsin inhibitors and phytates. Trypsin inhibitors can interfere with the action of trypsin, an enzyme needed to digest protein, while phytates can reduce mineral absorption. Usual preparation techniques, such as soaking and cooking dramatically, reduce these compounds. Since tofu is made of cooked soybeans, phytates and trypsin inhibitors are significantly reduced.

Soy products, including tofu, do contain goitrogens, as do many other foods such as cruciferous vegetables and flaxseeds. These are not an issue for healthy people, however, if you have an underactive thyroid, you can reduce the impact of dietary goitrogens by varying your diet, cooking goitrogenic

foods, and ensuring you meet the recommended intakes for iodine and selenium.

How much tofu and soy are safe?

While it is always advisable to consume a varied diet and not rely too heavily on a single food source, no adverse effects of soy have been noted in Asian populations consuming the most soy (about 25 grams of soy protein; 100 mg isoflavones per day), so this seems a reasonable upper limit for adults. Thus, for healthy adults, intakes of 3-4 servings per day seem a reasonable upper limit, while intakes of about 1-2 servings a day are suggested for children.

Tofu Selection

There are many types of tofu to choose from: soft, medium, firm, silken, sprouted, fermented, smoked, and flavored. Some tofu comes packaged in water, while other tofu comes in aseptic packaging and can be stored for several months. Generally, the package will provide an expiration date. Tofu can be frozen for about 5-6 months.

If you are looking for tofu to replace meat in a stir fry or other main dish, generally firmer tofu is the best choice. If you want tofu for a pudding, smoothie, or dessert, soft or silken tofu is usually the appropriate choice. Do read the label to double check calcium content, as it can vary wildly depending on the type of coagulant used. If you are concerned about digestion, select a fermented or sprouted tofu. If you are looking for convenience, select a smoked or flavored tofu that can simply be sliced and eaten.

Tofu Tips

1. **Select Tofu.** Select tofu with a short ingredient list. Some flavored or jarred tofu can contain a lot of added fat, salt, and preservatives.
2. **Drain Tofu.** If tofu is packed in water, you can drain it by placing it between two plates and placing a heavy can on top. Let sit for about 15 minutes and drain.
3. **Freeze Tofu.** If you want a tofu that is less moist and more chewy texture, simply freeze it. Squeeze out the excess moisture. After freezing, tofu soaks up sauces and flavors beautifully.

Meal Ideas

Breakfast – Add soft tofu to smoothies; use medium or firm tofu to make a tofu scramble or breakfast burrito.

Lunch – Blend soft tofu to make a veggie dip, or slice smoked or flavored tofu for sandwiches or wraps. Bake seasoned, cubed tofu and add to salads.

Dinner – BBQ tofu, bake tofu, or add tofu to stir fries. Add cubes of tofu to soups or stews and use tofu to replace feta in lasagna.

Desserts – use tofu to make puddings, mousses, “cheesecakes”, and other desserts.



Culinary tofu eating. Tofu isolated on white background.